

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 January 2004 (08.01.2004)

PCT

(10) International Publication Number
WO 2004/003059 A1

(51) International Patent Classification⁷: **C08G 77/06**,
H01L 21/31, 23/58

(21) International Application Number:
PCT/KR2003/001271

(22) International Filing Date: 27 June 2003 (27.06.2003)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
10-2002-0036426 27 June 2002 (27.06.2002) KR

(71) Applicant (for all designated States except US): **LG CHEM, LTD.** [KR/KR]; LG Twin Tower, Yoido-dong 20, Youngdungpo-ku, Seoul 150-721 (KR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KANG, Jung-Won** [KR/KR]; 2-306 Geukdong apt., Hagye-dong, Nowon-gu, Seoul 139-230 (KR). **MOON, Myung-Sun** [KR/KR]; 105-804 Saemneori apt., Dunsan 2-dong, Seo-gu, Daejeon-city 302-777 (KR). **KO, Min-Jin** [KR/KR]; 5-304 LG employee's apt., Doryong-dong, Yuseong-gu, Daejeon-city 305-340 (KR). **KANG, Gwi-Gwon** [KR/KR]; 1036-19 Hwagok 3-dong, Gangseo-gu, Seoul 157-013 (KR). **SHIN, Dong-Seok** [KR/KR]; 48-207 Siy-oung apt., Sincheon-dong, Songpa-gu, Seoul 138-240 (KR). **NAM, Hae-Young** [KR/KR]; 103-407 Boseong apt., Bokdae 2-dong, Heungdeok-gu, Cheongju-city, Chungcheongbuk-do 361-272 (KR). **KIM, Young-Duk** [KR/KR]; 101-904 Cheonggu apt., Jeonmin-dong,

Yuseong-gu, Daejeon-city 305-390 (KR). **CHOI, Bum-Gyu** [KR/KR]; 311-204 Songganggreen apt., Songgang-dong, Yuseong-gu, Daejeon-city 305-751 (KR). **KIM, Byung-Ro** [KR/KR]; 406-406 Expo apt., Jeonmin-dong, Yuseong-gu, Daejeon-city 305-762 (KR). **PARK, Sang-Min** [KR/KR]; 110-402 Hyundai apt., Yucheon 2-dong, Jung-gu, Daejeon-city 301-757 (KR).

(74) Agent: **YOU ME PATENT & LAW FIRM**; Teheran Bldg., 825-33, Yoksam-dong, Kangnam-ku, Seoul 135-080 (KR).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **ORGANIC SILICATE POLYMER AND INSULATION FILM COMPRISING THE SAME**

(57) **Abstract:** The present invention relates to a composition for forming a low dielectric insulating film for a semiconductor device, particularly to an organosilicate polymer prepared by mixing a thermally decomposable organic silane compound that is capped with a silane compound at both its ends, and a common silane compound or silane oligomer, and then adding water and a catalyst to conduct hydrolysis and condensation, as well as to a coating composition for an insulating film for a semiconductor device comprising the same, a coating composition for an insulating film for a semiconductor device further comprising a pore-forming organic substance, a method for preparing an insulating film for a semiconductor device by coating the composition and curing, and a semiconductor device comprising a low dielectric insulating film prepared by the method. The organosilicate polymer prepared according to the present invention has superior thermal stability and mechanical strength; an insulating film-forming composition comprising the same can be used for an interlayer insulating film for low dielectric wiring that can contribute to a high speed semiconductor, reduce power consumption, and remarkably decrease cross-talk between metal wiring; and a film obtained by applying the composition to an insulating film has superior coating properties, inhibits phase-separation, can easily control minute pores because organic substances are thermally decomposed to form pores during a curing process, and has superior insulating properties and a remarkably decreased film density.

WO 2004/003059 A1